# INDEX TO VOLUME XIII.


A

About-Town Jottings, 40, 88, 107, 155, 170, 408
Alabama, Resources of....8, 298, 362
Amalgamation in Pans.....257, 273
Amalgamation, A New.....377
American Institute of Mining Engineers, 41, 121, 131, 137, 153, 265, 338, 345, 352, 370, 377, 388, 395.
" " Official Bulletin, 36, 51, 72, 88, 104, 120, 132, 157, 171, 187, 201, 218, 232, 250, 266, 282, 296, 312, 328, 344, 360, 372, 395, 402, 407
American Technical Terms.....362
Andrews' Portable Engine.....49
Aniline Colors.....323
Arthracite and Bituminous Coals, Ages of.....89
Antimony in Nevada.....106
Appropriations.....330
Arizona, Resources of.....8
Arkansas Liguites, Phosporus in Iron, &c.....407
Artificial Stone, The Sorel.....66
Atomic Weights, Table of.....312
Atoms and Molecules.....291, 313

B

Babcock and Wilcox Tubulous Boiler.....368
Bacon's Hoisting Machinery, 97, 165, 353
Base Metals, Production of, in Colorado.....234
Berthelot's Investigation of Explosive Compounds.....345
Bessemer Process, Technical Education in.....3
Bethlehem.....329
Bi-Sulphide of Carbon Engine....147
Blake's Crusher.....169
Blake's Patent Fire Pump.....17
Blast Furnace Fuel.....218
Blast Furnace Slags.....2
Blast Furnace Slags, Uses of.....306
Blowpiping, Instruction in.....218
Board of Health.....169
Boiler Explosions.....161, 211
Boiler Explosions, Investigation of.....323, 330
Boilers, Report on.....113
Boring Shafts.....368
Bullion Product fo 1871.....407
Burleigh Rock Drill and Air Compressor.....209

C

Caisson of East River Bridge.....296
Calcasieu Sulphur Mine.....99
California Geological Survey.....248
Carbon in Pig Iron, Condition of..372
Car Propulsion by Pneumatic Power.....58, 90, 98
Centennial Celebration, The.....185
Channel Tunnel, A.....87
Charcoal, Action of Nitric Acid on.....164
Chihuahua, Treatment of Silver Ores in.....211, 259
Chili Copper Mines..330, 340, 363, 387
Clarence King's Maps.....87
Classification of Nat. and Art. Products.....377
Coal and Iron Ore, Scarcity of, in England.....231
Coal Barges, Improved.....385
Coal Beds of Illinois.....280
Coal Dust, the Burning of.....9, 49
Coal Dust, Utilization of.....3, 152
Coal Mines, Explosions in.....151
Coal Outlook, The.....4
Coal, Pillars of.....162, 186
Coal Regions, Rothwell's Map of..25
Coals of the Far West.....376
Coliseum, Fall of.....297
Collieries, Number of.....228
Colorado, Affairs in.....9
Colorado, Mining in.....132
Colorado Ores and Veins.....392
Colorado, Production of Base Metals in.....234
Colorado, The Progress of.....40
Communication between France and England.....360
Complete Combustion in Furnaces 249
Compressed Air, Propulsion by...24, 58, 90, 98
Comptroller of the Currency.....249
Concentration, Dry Crushing and..58, 89, 106, 122, 129, 156, 161
Concentration of Ores by means of Air.....169
Congress and Science.....361
Congress, Mining Matters in.....89
Cooper Union Lectures.....104, 180
Copper, Preparation of Sub Oxide of.....363
Copper Mines of Chili, 330, 340, 363, 387, 406
Corrections.....371, 393
Crooked Ways.....201
Crystallized or Burnt Iron.....344

D

Danish Iron Steamers.....200
Danks' Puddling Furnace, 9, 87, 120, 138, 152, 180, 313
David Thomas.....153
Death Valley Mineral Region.....26
Delaware River Manufactures....244
Delhi, Iron Pillar in.....216
Dephosphorizing Iron Ore.....250
Detector, A Low Water.....273
Diamonds in the Ural.....42
Drill and Air Compressor, Burleigh's.....209
Dry Concentration.....180
Dry Crushing and Concentration, 58, 89, 106, 122, 129, 156, 161

E

Earthquake, Region of the Late..264
Editorial Changes.....361
Electro Magnetic Engines.....245
Electro Magnetic Iron Separator..168
Electromagnetism.....123
Ellis' Bisulphide of Carbon Engine.....147
Emma Mine, The.....393
Emma Mine, Cave at.....393
Engineering and Mechanical Notes 356, 385
Engines, Electro Magnetic.....248
Engines, High Speed.....163
England, Scarcity of Coal and Iron in.....231
English Inventive Genius.....180
English Metal Market.....151
English Mines' Regulation Bill...225
Eureka, Nevada.....200
Explosions in Coal Mines.....151
Explosion in the Henry Colliery..104
Explosions, Temperature of.....116
Explosive Compounds, Berthelot on.....345

F

Fallacy in Scientific Conclusions..217
Fire Damp from Anthracite.....361
Fire Proof Safes.....251
Fissure Veins, Some Characteristics of.....209
Flying Machine, A New.....4
Fracture of Railway Axles.....225
Fuel, Blast Furnace.....218
Furnaces, Complete Combustion in.....249

G

Geological Survey of California..248
Geological Survey of Ohio.....233
Geology, The Importance of Surveying in.....194
Germany, Mineral Product of.....232
Geyser, the Giant.....297
Gold Mining in Oregon.....408
Good Plan, A.....377
Graduates, Young.....249
Great Britain, Pig Iron Production in.....152
Gruner on Steel.....249
Gulf Stream, The.....20

H

Hassler Expedition.....25, 26
Heat, A Hypothesis relating to....83
Heat, Mechanical Equivalent of...235
Heat, Transmission of.....244
Hell Gate Obstructions, The.....200
Hewitt on the Resources of Alabama.....8
High Speed Engines.....163
Hoisting Machinery, Bacon's..97, 353
Hoosac Tunnel, The.....24, 100

I

Ice, Artificial.....164
Illinois Coal Beds.....280
Inhabitants of the Sea.....25
Instruction in Blowpiping.....218
Iron and Iron Ore in Milwaukee..378
Iron and Steel, Brown Tint for...100
Iron and Steel Rails, Manufacturers of.....145
Iron Bureau, An.....377
Iron, Crystallized or Burnt.....344
Iron Industry, Our.....313
Iron in the United States.....20
Iron Making in Rhode Island.....386
Iron Mining at Lake Superior.....202
Iron Ore, Dephosphorizing.....250
Iron Paper, The thinnest.....36
Iron Pillar in Delhi, India.....216
Iron Product of Lake Superior....51
Iron Separator, An Electro-Magnetic.....168
Iron Statistics, American.....39
Iron Works, The Wadsworth.....105

J

Jersey City Water Works.....36
Jigger, Continuous.....177

K

Kaolin of U. S., The.....346
Krupp's Guns.....321

L

Lake Superior Iron Product.....51
Lake Superior, Method of Iron Mining.....202
Lead Smelting in Nevada and Utah.....19, 33, 49, 82, 97
Lectures on Science, Spring Course 216
Lehigh Zinc Co., New Pumping Engine.....65
Lehigh Furnace Managers, Meeting of.....122
Lehigh Valley, Furnaces in.....152
Lesley, Prof. J. P., Address to Am. Inst. of M. E.....131
Lignites of Far West, Value of....378

M

Machine Belting.....386
Mechanical Equivalent of Heat...235
Mechanical Puddling.....120
Metallurgical Value of Lignites of Far West.....378
Meteorological Reform.....258
Meteorology.....328
Mine Pumps, Improvements in....25
Mineral Product of Germany.....232
Mineral Resources of N. Carolina, 225, 280, 290, 308, 323
Mineral Species in Utah.....17
Miners' Strike at Austin.....169
Mines, Mills and Furnaces.....57
Mines Regulation Bill, English...225
Mine Ventilation Law, Important Decision.....139
Mining Bill, A New.....72
Mining Bureau, A.....297
Mining Law, The New, 89, 328, 345, 347
Mining Matters in Congress.....89
Mint, The United States, and Branches.....24
Missouri, The Tin Mines of.....56
Missouri Tin.....137
Montana Correspondence.....41
Montana, Silver Mining in.....120

N

National Bar Iron Association....322
Nevada, Miners' Strike in.....169
Nevada, Antimony in.....106
Nevada and Utah, Lead Smelting in.....19, 33, 48, 82, 97
New Markets for Ores.....377
New Publications:
Bradley on Coal and Iron in Tennessee.....9
American Locomotive Engineering and Railway Mechanism...56
Mines, Mills and Furnaces.....57
The Sutro Tunnel Report.....72
The Coal and Iron Record.....116
The Metric System of Weights and Measures.....121
Hinrich's Elements of Chemistry and Mineralogy.....136
Tredgold's Elementary Principles of Carpentry.....168
Greenwell's Mine Engineering..185
Oregon and her Resources.....250
Geological Survey of Indiana, Second Report.....250
Plain Directions for Construction and Erection of Lightning Rods.....232
Tables of Weights, Measures, Coins, etc.....232
Nystrom's Pocketbook of Mechanics and Engineering.....216
Coal Mining and Statistics of Coal, Iron and Oil.....216
Practical Treatise on the Construction of Water-wheels....264
Recollections of Past Life.....264
Pre-Historic Times.....264
Popular Science Monthly...264, 328
Elementary Manual of Chemistry 281
Astronomy and Geology Compared.....282
Science Primers.....282
How the World was Peopled....282
Pocket Dictionary of Technical Terms.....356
Census Report on Agriculture..356
Geological Survey of Montana, Preliminary Report.....376
Phillips on Mining and Assaying 281
Ohio Geological Survey.....233
Gruner on Steel.....249
Newspaper.....100
Niagara Vacuum Pump, Improved 289
Nickel Plating without the Battery, 164
Nitric Acid, Action of, on Charcoal, 164
North Carolina, Mineral Resources of.....290, 308, 323
Northern Pacific Railroad.....180
Notes, Engineering and Mechanical.....356, 385

O

Ohio Geological Survey.....233
Oil Well on Fire.....1
Oppression by Law.....185
Ores, New Markets for.....377
Origin of Metalliferous Deposits, The.....394, 401
Oxy-hydric Light.....312


168895

# INDEX.


P

Patent Laws, Inconveniences of the 329
Pennsylvania Accidents 297
Peteler Portable Railroad 336
Phillips on Mining and Assaying 281
Pig Iron Manufacturers' Association 100
Pig Iron Production of the World in 1871 216
Pig Iron Production in Great Britain 152
Pillars of Coal 162, 186
Polytechnic Association of the American Institute, 4, 8, 18, 27, 34, 67, 82, 115, 129, 147, 155, 170, 184, 200, 212, 234, 243, 282, 289, 289, 305, 321, 371

Popular Science.

Measurements of Progress 8
Lost Arts, The 24
Combustion 40
The Tones of Speech 56
Polar Explorations 72
The Spheroidal State of Water 88
Insensibility of the Human Body to Molten Iron 104
The Art of Counting 120
The Birth of an Iceberg 136
The East River Bridge Caisson 296
The Oxy-hydric light 312
Meteorology 328
Portable Engine, Andrews' 49
Portable Hoisting Engine, Bacon's 65
Portable Railroa' Peteler 335
Portable Steam Engine, Wood & Mann 145
Portage Lake Mining District 193
Portland Cement 210
Practical Engineering, Society of 392
Progressive Instruction in Chemistry 136
Pump, Blake's Patent Fire 17
Pumping Engine, A Mammoth 73
Pumping Engine of the Lehigh Zinc Co. 65
Pump, Niagara Vacuum 289
Pump, Selden Double-Action Plunger 1
Pump, Wright's Bucket Plunger 81

R

Railroad, Peteler's Portable 336
Railway Axles, Fracture of 225
Railway Signals 392
Rapid City Transit 28
Red River Country, Gold and Silver in 296
Rich Mine, A 200
Rolling Mill Machinery 105
Rolling or Hammering Ingots 248
Rothwell's Map of the Wyoming Valley 4, 25

S

Safes, Fire Proof 251
Safety Lamps, Magnetic Lock for 356
Scientific Notes 4, 18, 27, 34, 67, 82, 282, 305
Scrap, Piling and Selection of 72
Selden Pump, The 1
Shaft Accidents 329
Shaft-sinking with Large Drills 113
Silicate of Soda, New Use for 72
Silver Ores, Treatment of, in Chihuahua 211, 259
Silver, Preparation of Pure 315
Silver, Sulphuret Veins, etc., of 260
Slags, Use of Blast Furnace 306
Snow Blockade 87
Something New 329
Sorel Artificial Stone 66
South Carolina, State Inspector of Phosphates 361
South Mountain, Brown Hematite Deposits of 10
Southwestern Items 50
Specific Gravity of Alloys 344
Spectrum Analysis, Schellen's 265
Stapff's Continuous Jigger 177
Stassfurt, The Potash, Soda, etc., Deposits of 68
Stassfurth Manufacturers, The 276
State Inspector for S. Carolina 381
Steam-Brake for Winding Engines 42
Steam Engine, Improvement of 178
Steam Engineers, Education of 178
Steam Tillage 387
Steel, Classification of 42
Steel from Pig 180
Sterry Hunt 57
Stevens Inst. of Technology 91, 216, 241
Stewart's Works, The Destruction of 81
Stockton Mines, The 328
Strength of Metals, Machine for Testing 257
Strikes in Germany 81
Sulphuretted Hydrogen and Carbonic Acid 36
Sulphur, Metallurgy of, in Sicily and Spain 33
Sulphur Mine, The Calcasieu 99
Sun's Surface, Temperature of the 169
Surveying in Geology 194
Sutro Tunnel Report, The 72
Sutro Tunnel, The 167, 265, 393

T

Technical Lectures 49
Temperature Underground 228
Texas Correspondence 24
Thomas, David 153
Tin-Lined Lead Pipe in France 72
Tin Mines of Missouri 56, 139
Tin Ore in America 360
Tin Scrap Process, A New 57
Titaniferous Iron Ores 148
Titaniferous Ores, Use of 275
Transit, Rapid City 28
Tubulous Boiler, Babcox & Wilcox 368

U

Underground Temperature 228
Undulations, Lengthening of 196
Utah, Geological Notes on 115
Utah, Lead Smelting in Nevada, and 19, 33, 49, 82, 97
Utah, Mineral Species in 17
Utah Ores 124
Utah Silver Mining and Smelting Co. 73
Utah Silver Mining Co 201

V

Veins of Sulphuret of Silver 260

W

Wadsworth Iron Works 105
Water-tight Roofing Material 180
Water Works, Jersey City 36
Western & Co., Dissolution of Partnership 297
Wood & Mann Portable Steam Engine 145
Wright's Bucket Plunger Steam Pump 81
Wyoming Valley, Rothwell's Map of 4, 25

Y

Young Graduates 249


## ADVERTISEMENTS.


BANKERS.

Cooke, Jay, & Co 32

BOILERS.

Babcock & Wilcox 304
Root Steam Engine Co 215

COAL.

Audenried L. & Co 16
Bonnell Saml. Jr. 16
Consolidation Coal Co 13
Coxe Bros. & Co 16
Delaware, Lackawanna and W. R. R. 76
Despard Coal Co. 16
Detmold & Cox 60
Hefford & Co. R. R. 239
Lee S. S. & Son 351
Linderman, G. B. & Co 16
Maryland Coal Co 60
Newburgh Orrel Coal Co. 16
New Central Coal Co 60
Tower, Lawrence 384
Wilkesbarre Coal & Iron Co 16

CHEMISTS SUPPLIES.

Benjamin, E. B. 13
Feuchtwanger, L. & J. W. 112

DRILLS AND EXPLOSIVES.

Burleigh Rock Drill Co 205
Diamond Drill Co 16
Dickinson, John 15
Laflin & Rand 16

ENGINEERS AND CHEMISTS.

Allen, Theodore 15
Buel, Richard H 115
Cornwall, H. B 183
Drown, T. M. 13
Kenrick & Co 119
Maynard & Van Rensselaer. 374
Ott, Adolph 15
Rothwell, R. P. 14
Thoulet & Rascher 15
Van Der Weyde, P. H. 15
Van Wagenen, T. F. 160
Walz, Dr. J. 13
Whitney, Jas. A. 364

HOISTING MACHINERY.

Morris Co. Machine & Iron Co. 32
Otis Brothers 336

IRON, STEEL AND ZINC.

Cooper, Hewitt & Co 15
Griswold, John A., & Co 13
Lehigh Zinc Co 13

MACHINERY.

Baxter Engine 48
Ferracute Machine Works 183
Lyon, E. 14
Post & Goddard 16
Rogers, H. A. & Co 14
Roper Caloric Engine 119
Sturtevant, B. F. 14
Tuck, French & Goddard 381
Utica Steam Engine Co. 119
Waring & Parke 62
Worthington, H. R. 14

MINING MACHINERY.

Asmus, George 14
Blake Bros. 13
Krom, S. R. 14
Morey & Sperry 14
Sontag, H. 14

MISCELLANEOUS.

Adelberg Gold Co. 39
American Metallurgical Co 39
Belting & Packing Co., N. Y. 16
Colwells, Shaw & Willard Mfg. Co. 364
Chalmers, J. 15
Clay Retorts 16
Gostling, John C. 16
McNamara, W. F. 15
Keuffel & Esser 16
Nason, Joseph & Co. 14
Paine, W. H. 199
Palmer, Courtland, Jr 16
School of Mines 16
Scientific Publishing Co. 327

PUBLISHERS AND PUBLICATIONS

American Chemist 103
Dana & Silliman 13
Dewy & Co 39
Engineering 160
Iron World Publishing Co 15
Lippincott & Co., J. B. 224
Manufacturer & Builder 207
Map of the Wyoming & Lackawanna Coal Fields 61
Mechanics Magazine 15
Murphy & Co., J. Arthurs 95
National Oil Journal 269
Van Nostrand, D. 284
Western & Co. Publishers 15
Zell, T, E. 15

PUMPS.

American Submerged Pump 119
Cameron, A. S. & Co 15
Carr, A. 14
Clayton, James 15
Cope & Maxwell 23
Guild & Garrison 15
Hardick, C. B. 15
Knowles & Sidley 15
Propeller Pump 16
Valley Machine Co 16

RAILROADS, & RAILROAD SUPPLIES.

Baird, M. & Co 13
Cincinnati & Terre Haute R. R. Co 399
Circular Slide Valve. 399
Dana & Co. 16
Peteler R. R. Co. 398

SMELTING WORKS.

Smelting & Refining Co. St. Louis. 381
H. Robertson 381

WANTS AND FOR SALE.

Baldwin Locomotive Works 381
Blast Furnaces for Lease 391
David, H. J. 60
Iron Mine for sale 23
Mill & Water Power for sale 192
Mine Superintendent Wanted. 349
Mining Engineer 183
Van Wart & McCoy 80


## Mining Summary.


Arizona 12, 107, 172, 267
British America 380
California 12, 43, 59, 107, 139, 187, 235, 252, 267, 283, 332, 348, 364
Colorado 11, 43, 75, 91, 108, 141, 151, 172, 236, 267, 331, 395
Dacotah 251
Idaho 12, 44, 92, 108, 172, 108, 236, 266, 284, 364, 380
Increase of Mining Stock Capital 295
Michigan 332
Mining Dividends 172
Mining Review 74, 299
Montana 13, 252, 267, 380
Nevada 11, 59, 76, 91, 107, 140, 172, 188, 204, 235, 251 266, 284, 315, 408, 380, 395
Pennsylvania 91, 172, 299
Utah 12, 124, 252, 316, 331

=
16
15
16
14
99
16
16
27
NS
03
13
39
60
15
24
07
61
15
95
269
284
15
15
119
15
14
15
23
15
15
15
16
16
UP-
13
399
399
16
398
381
381
381
391
60
23
192
349
183
80
, 267
380
187,
, 364
151,
, 395
251
236,
, 380
1 295
332
172
4, 299
7, 380
172,
, 315,
), 395
2, 299
3, 331